Notice of Allowability	Application No.	Applicant(s)	
	10/736,925	CULP, DAVID A.	
	Examiner	Art Unit	
	Timothy D. Collins	3643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *RCE filed 3/24/06*.

2. ☒ The allowed claim(s) is/are *45 and 47-70*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20060522* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Applicants' supplemental declaration in response to the request for information from the examiner is accepted and is persuasive. Therefore the examiner withdraws the request for information under 35 USC 1.105.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Charles Thoeming on 5/17/06.

The application has been amended as follows:

The following listing of claims replace all previous claims.

1. (Canceled)
2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Canceled)

38. (Canceled)

39. (Canceled)

40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (New) Wind powered apparatus for transportation modes selected from the group consisting of watercraft, marine structures, skis, sail boards, land vehicles, dirigibles, aircraft, satellites, space craft, and nano-scale vehicles, the apparatus comprising:

a single layer aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines,

without bridles, and without rigid structure, and comprising a centerline, wingtips, and a tail corner; and further comprising a light weight, three dimensional wing consisting of a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing and into pure tension transferred to the attachment means, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity; and

attachment means linking at least one aerodynamic wing to a transportation mode whereby wing function and transportation mode motion are controlled.

46. (Canceled)

47. (New) The apparatus of claim 45, wherein the aerodynamic wing comprises a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, wingtips, tail corner, an inside windward surface, and an

outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing and into pure tension transferred to the attachment means, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

48. (New) The apparatus of claim 45, wherein attachment means define axes in relation to the wing and transportation mode, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the wing, and airflow within, are controlled by independent manipulation of attachment means length.

49. (New) The apparatus of claim 48, wherein the wing further comprises of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

50. (New) The apparatus of claim 49, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the wing's centerline or near its nose on the wing's inside surface, and whereby the wing is rendered neutrally or negatively buoyant in air by at least one enclosure.

51. (New) The apparatus of claim 50, wherein the wing consists

of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

52. (New) The apparatus of claim 47, wherein attachment means define axes in relation to the wing and transportation mode, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the wing, and airflow within, are controlled by independent manipulation of attachment means length.

53. (New) The apparatus of claim 52, wherein the wing further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

54. (New) The apparatus of claim 53, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the wing's centerline or near its nose on the wing's inside surface, and whereby the wing is rendered neutrally or negatively buoyant in air by the at least one enclosure.

55. (New) The apparatus of claim 54, wherein the wing consists of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely

along or parallel to the wing centerline.

56. (New) A three-dimensional, aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, comprising:

a centerline;

wingtips;

a tail corner; and

a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

57. (New) A three-dimensional, aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, comprising:

a centerline;

wingtips;

a tail corner; and

a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

58. (New) An aerodynamic, three dimensional kite capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, to replace downwind and cross wind sails on a sailing craft having at least one mast, comprising:

a centerline;

a plurality of tips;

a tail corner;

a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over

leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the kite resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the kite, and whereby the profile of the kite approaching the trailing edge exhibits increasing convexity; and

attachment means linking kite tips to points on the sailing craft other than a mast whereby kite function and sailing craft motion are controlled.

59. (New) The kite apparatus of claim 58, wherein attachment means comprises three flexible flying lines of predetermined adjustable length, each flying line comprising two ends, wherein for each flying line one end is affixed to a unique kite tip and the other end is affixed to a unique point on the sailing craft.

60. (New) The kite apparatus of claim 59, wherein the flying lines further define three axes in relation to the kite and sailing craft, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the kite, and airflow within, are controlled by independent manipulation of flying line

length.

61. (New) The kite apparatus of claim 59, wherein the plurality of gores are secured and connected to form the three dimensional kite by first adhesively securing jointures between edge-to-edge gores using double-sided adhesive means, then sewn using flat overlapping seams and a zigzag sewing stitch.

62. (New) The kite apparatus of claim 59, wherein the kite further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

63. (New) The kite apparatus of claim 62, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the kite's centerline or near its nose on the kite's inside surface, and whereby the kite is rendered neutrally or negatively buoyant in air by the at least one enclosure.

64. (New) The kite apparatus of claim 63, wherein the kite further comprises of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

65. (New) An aerodynamic, three dimensional kite capable of flying with variable wind direction and angle of attack,

without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure to replace downwind and cross wind sails on a sailing craft, comprising:

a centerline;

a plurality of tips;

a tail corner;

a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the kite resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the kite, and whereby the kite profile approaching the trailing edge exhibits increasing convexity; and

attachment means linking kite tips to points on the sailing craft other than a mast whereby kite function and sailing craft motion are controlled.

66. (New) The kite apparatus of claim 65, wherein attachment means comprises three flexible flying lines of predetermined adjustable length, each flying line comprising two ends, wherein for each flying line one end

is affixed to a unique kite tip and the other end is affixed to a unique point on the sailing craft.

67. (New) The kite apparatus of claim 66, wherein the flying lines further define three axes in relation to the kite and sailing craft, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the kite, and airflow within, are controlled by independent manipulation of flying line length.

68. (New) The kite apparatus of claim 66, wherein the kite further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

69. (New) The kite apparatus of claim 68, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the kite's centerline or near its nose on the kite's inside surface, and whereby the kite is rendered neutrally or negatively buoyant in air by the at least one enclosure.

70. (New) The kite apparatus of claim 69, wherein the kite further comprises of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

2. The following is an examiner's statement of reasons for allowance:

a. Re claims 45 and 56, the prior art of record all failed to show either alone and/or in combination a wind powered apparatus or wing with a single layer wing without surface discontinuity, without bridles, without stabilizing lines, without rigid structure and with wingtips and a tail corner and having a plurality of gores which define a large diameter self-supporting rolled over leading edge and with the trailing edge having an increasing convexity.

b. Re claim 57, the prior art of record all failed to show either alone and/or in combination a wing apparatus with a single layer wing without surface discontinuity, without bridles, without stabilizing lines, without rigid structure and with wingtips and a tail corner and having a molded single continuous sheet of material with a large diameter self-supporting rolled over leading edge and with the trailing edge having an increasing convexity.

c. Re claim 58, the prior art of record all failed to show either alone and/or in combination a kite apparatus with a single layer wing without surface discontinuity, without bridles, without stabilizing lines, without rigid structure and with wingtips and a tail corner and having a plurality of gores which define a large

diameter self-supporting rolled over leading edge and with the trailing edge having an increasing convexity.

d. Re claim 65, the prior art of record all failed to show either alone and/or in combination a kite apparatus with a single layer wing without surface discontinuity, without bridles, without stabilizing lines, without rigid structure and with wingtips and a tail corner and having a molded single continuous sheet of material with a large diameter self-supporting rolled over leading edge and with the trailing edge having an increasing convexity.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy D. Collins whose telephone number is 571-272-6886. The examiner can normally be reached on M-F, 7:00-3:00, with every other Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter M. Poon can be reached on 571-272-6891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

5/22/06

Timothy D. Collins
Patent Examiner
Art Unit 3643